

SPECIFICATIONS FOR DENATURED FUEL ETHANOL

**PRESENTED AT THE CALIFORNIA PHASE 3
REFORMULATED GASOLINE REGULATION WORKSHOP**

August 18, 2000

**Carl F. Reeder
Archer Daniels Midland Co.
Chairman, Renewable Fuels Association
Technical Committee**

INFORMATION REPORTED BY PRODUCERS

<u>Information Requested</u>	<u>Average</u>	<u>Range</u>
Sulfur content of the undenatured ethanol	2.9 ppm mass	1 –11 ppm mass
Sulfur content of the denatured ethanol	8.7 ppm mass	2.1 – 27.2 ppm mass
Sulfur content of the currently used denaturant	127.7 ppm mass	9.1-733.9 ppm mass
Benzene content of the denaturant	0.63 vol. %	0.01 - 1.94 vol. %
Olefin content of the denaturant	0.55 vol. %	0.02 – 2.1 vol. %
Aromatic content of the denaturant	1.33 vol. %	0.05 – 6.6 vol. %

Note: The above represents 81% of 1.75 billion gallons of yearly production capacity in the ethanol industry.

LOGIC FOR 15 PPM SULFUR SPECIFICATION

AVERAGE 8.7 PPM SULFUR, BASED UPON ONE SAMPLE PER PLANT.

VARIATIONS AFFECTING SULFUR CONTENT

- 1. DAY TO DAY PRODUCTION VARIATIONS**
- 2. VARYING LEVELS OF SULFUR FROM ONE PLANT TO ANOTHER**
- 3. VARIATIONS IN SULFUR CONTENT OF THE NATURAL GASOLINE**
- 4. UNKNOWN BIAS OF THE SULFUR ANALYTICAL METHOD**

PROPERTIES OF NATURAL GASOLINE
HISTORICALLY AVAILABLE FOR
DENATURING OF ETHANOL

Color, Saybolt	+25 to +30
API Gravity	80 - 85
RVP @ 100°F, psi	13 - 14
Sulfur, ppm	60 - 160
Research octane number	76
Motor octane number	74
Distillation °F, Typical	
1 BP -	92
10% -	105
20% -	110
50% -	125
90% -	185
FBP -	265
Benzene, volume %	0.3 - 1.2
Olefins, volume %	0.1 - 0.8
Aromatics, volume %	1.0 - 2.6

ETHANOL PRODUCERS' COMMITMENT

**MAXIMIZE THE AVAILABILITY OF FUEL ETHANOL TO THE
CALIFORNIA MARKET.**

**PROVIDE A HIGH QUALITY PRODUCT THAT WILL MEET
REFINER'S REQUIREMENTS FOR BLENDING WITH CARBOB.**

**FACTORS NEEDED TO MAXIMIZE SUPPLY
OF FUEL ETHANOL TO CALIFORNIA**

**SPECIFICATIONS THAT REQUIRE NO SPECIAL
DENATURANTS SUCH AS CaRFG3 GASOLINE OR
REFINERY STREAMS.**

**REASON: CURRENT USE OF NATURAL GASOLINE
DENATURANT ALLOWS PRODUCERS TO MEET RFA
PROPOSED ETHANOL SPECIFICATIONS FOR
CALIFORNIA AND ALL OTHER STATES.**

**FACTORS NEEDED TO MAXIMIZE SUPPLY
OF FUEL ETHANOL TO CALIFORNIA**

**MAINTAIN THE USE LEVEL OF NATURAL GASOLINE
DENATURANT AT FIVE GALLONS DENATURANT PER 100
GALLONS OF ETHANOL.**

**REASON: A SPECIALTY PRODUCT FOR CALIFORNIA WOULD
REQUIRE SEPARATE PRODUCTION RUNS AND SEGREGATED
STORAGE AT THE PRODUCTION PLANT. PRODUCERS HAVE
STORAGE TANKS FOR ONLY ONE COMMERCIAL PRODUCT.**

**THERE IS NO CERTAINTY THAT THE BATF WILL APPROVE A
LOWER PERCENTAGE OF NATURAL GASOLINE
DENATURANT.**

CONSEQUENCES OF DENATURANT CHANGES

SOME PRODUCERS MAY DECIDE NOT TO PRODUCE A DIFFERENT PRODUCT FOR ONLY THE CALIFORNIA MARKET AND TO SELL THE STANDARD PRODUCT ELSEWHERE.

ALL OTHER STATES ACCEPT THE CURRENT FUEL ETHANOL. PRODUCERS WOULD HAVE DIFFICULTIES SCHEDULING PRODUCTION, SEGREGATING IN STORAGE AND DISTRIBUTING A SPECIAL PRODUCT FOR CALIFORNIA.

BOTTOM LINE: RESTRICTION OF FUEL ETHANOL SUPPLY AND DISRUPTION OF DISTRIBUTION FOR A NATIONALLY ACCEPTED PRODUCT.



DEPARTMENT OF THE TREASURY
BUREAU OF ALCOHOL, TOBACCO AND FIREARMS
130 SOUTH DEARBORN STREET - 16TH FLOOR
CHICAGO, ILLINOIS 60604
JUN 25 1985

REF ID: A66666
HW:C:T:ch:RA
5110
ATF-IL-265
312/353-5946

Archer Daniels Midland Company
P. O. Box 1470
Decatur, Illinois 62525

Attention: A. M. McHaffie
Attorney-in-Fact

Re: Letter application dated May 21, 1985 filed under Title 27, Code of Federal Regulations 19.1006 and 21.91, for approval of use of natural gasoline for denaturation of fuel alcohol and Completely Denatured Alcohol Formula 20.

Gentlemen:

Your application to manufacture fuel alcohol at your alcohol fuel plants and CDA-20 at your distilled spirits plants by adding 5 gallons of natural gasoline to every 100 gallons of spirits of 195 degrees proof or higher has been approved. This approval is applicable to all plants being operated by Archer Daniels Midland Company under the corporate name and under the World Ethanol Company partnership within ATF Midwest Region.

This authorization is subject to the following terms and conditions:

- (1) The natural gasoline used must correspond to the attached specification schedule.
- (2) The exact composition of fuel alcohol manufactured at alcohol fuel plants and of CDA-20 manufactured at distilled spirits plants with natural gasoline must be marked on containers. For example, "95 Percent Ethanol/5 Percent Natural Gasoline."
- (3) The approval will be rescinded if it results in any jeopardy to the tax revenue or causes administrative difficulties.

You are reminded that you must comply with restrictions imposed on automotive fuels by the Department of Energy and the Environmental Protection Agency. Fuel manufactured with natural gasoline may not meet the standards for automotive fuel imposed by these Agencies.

Sincerely yours,

David R. Chupp
David R. Chupp

Regional Director (Compliance)

PROPOSED SPECIFICATIONS

RFA RECOMMENDATION

FOR FUEL ETHANOL

FLAT LIMITS

PROPOSED CARFG3

FLAT LIMITS

SULFUR, MAX. – 15 PPM MASS

SULFUR, MAX. - 20 PPM MASS

BENZENE, MAX. - 0.10 VOL. %

BENZENE, MAX. - 0.80 VOL. %

OLEFINS, MAX. - 0.50 VOL. %

OLEFINS, MAX. - 6.0 VOL. %

AROMATICS, MAX. – 1.70 VOL. %

AROMATICS, MAX. – 25 VOL. %